AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code	Page	Of
Cost-Plus-Fixed-Fee	1	4

2. Amendment/Modification No.	3. Effective Date	4. Requisition/Purchase Req No.	5. Project No. (If applicable)
P00001	2007MAY23	SEE SCHEDULE	

6. Issued By Code W56HZV

U.S. ARMY TACOM LCMC
AMSTA-AQ-ABGB
ROBERT BEARDSLEE (586)574-8071
WARREN, MICHIGAN 48397-5000
HTTP://CONTRACTING.TACOM.ARMY.MIL
WEAPON SYSTEM: WPN SYS: 00
EMAIL: ROBERT.BEARDSLEE@US.ARMY.MIL

7. Administered By (If other than Item 6) Code S3911A

DCMA PITTSBURGH
VA HIGHLAND DRIVE FACILITY BLDG 6
7180 HIGHLAND DRIVE
PITTSBURGH PA 15206-1297

SCD C **PAS** NONE **ADP PT** HQ0337

8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code)

RE2, INC.
32 39TH STREET
PITTSBURGH, PA 15201-3205

TYPE BUSINESS: Other Small Business Performing in U.S.

Code 3MDR5 **Facility Code**

☐ **9A. Amendment Of Solicitation No.**

9B. Dated (See Item 11)

☒ **10A. Modification Of Contract/Order No.**
W56HZV-06-C-0579

10B. Dated (See Item 13)
2006SEP22

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ **The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers**
☐ **is extended,** ☐ **is not extended.**

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendments: (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting And Appropriation Data (If required)
NO CHANGE TO OBLIGATION DATA

13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS

KIND MOD CODE: G

It Modifies The Contract/Order No. As Described In Item 14.

☐ **A. This Change Order is Issued Pursuant To: The Changes Set Forth In Item 14 Are Made In The Contract/Order No. In Item 10A.**

☐ **B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).**

☒ **C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:** FAR 43.103(a)(3): Mutual Agreement

☐ **D. Other (Specify type of modification and authority)**

E. IMPORTANT: Contractor ☐ **is not,** ☒ **is required to sign this document and return _____ copies to the Issuing Office.**

14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)		16A. Name And Title Of Contracting Officer (Type or print)	
		MICHAEL L. CIONI MICHAEL.CIONI@US.ARMY.MIL (586)574-7070	
15B. Contractor/Offeror	**15C. Date Signed**	**16B. United States Of America**	**16C. Date Signed**
_____ **(Signature of person authorized to sign)**		**By** /SIGNED/ **(Signature of Contracting Officer)**	2007MAY23

Name of Offeror or Contractor: RE2, INC.

SECTION A - SUPPLEMENTAL INFORMATION

1. Bilateral Modification P00001 revises Contract W56HZV-06-C-0579 as follows:

In Section C (Description / Specifications / Work Statement), paragraph C.2.3, we're changing the requirements for the Small Robot Infrastructure Toolkit (SRIT), so the SRIT shall include a rotating gripper attachment rather than a pan-tilt attachment. The revised page is attached.

2. Except for the changes resulting from this Modification P00001, all other contract terms and conditions remain the same.

*** END OF NARRATIVE A 0001 ***

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 RE2, Inc., (i.e., the Contractor), acting as an independent contractor and not as an agent of the Government, shall provide the necessary personnel, facilities, materials, and services to complete this Contract.

C.2 Small Robot Infrastructure Toolkit (SRIT). RE2 shall design, develop, fabricate, assemble, integrate, test, evaluate, demonstrate, and deliver a prototype SRIT meeting the following requirements:

C.2.1 2-Degree of Freedom (DOF) Arm. The SRIT shall include a 2 DOF arm, with the following capabilities:

C.2.1.1 The arm shall be able to lift weight equivalent to 1 liter of water

C.2.1.2 The arm shall be able to move at peak speeds of at least 30 degrees per second

C.2.1.3 The total weight of the arm and control electronics shall be under 35 lbs.

C.2.1.4 The reach of the arm shall be at least 30" from the center of rotation of the base of the lower arm segment.

C.2.1.5 The end of the upper arm segment shall be equipped with a Quick-Release (QR) mechanism which passes rotational mechanical power through a Power-Take-Off (PTO) connection. Electrical signals shall also pass through the QR connector allowing for tool identification signals to pass from tools to the control electronics for the arm.

C.2.1.6 The control electronics shall be able to recognize different tools attached to the arm and relay the tool information to the Operator Control Unit (OCU) via a Joint Architecture for Unmanned Systems (JAUS) Version 3.2 communications link.

C.2.1.7 The arm control electronics shall control the PTO motor based on JAUS 3.2 command messages received from the OCU.

C.2.2 Digging Tool Attachment for the Arm. The SRIT shall include a digging tool attachment for the arm, with the following capabilities:

C.2.2.1 The digger shall be able to dig material that weighs the equivalent of 1 liter of water.

C.2.2.2 The digger shall be able to move at peak speeds of at least 10 degrees per second.

C.2.2.3 The total weight of the digger shall be under 7 lbs.

C.2.2.4 The digger shall be able to curl and uncurl, based on input through the PTO connection.

C.2.2.5 The digger shall be able to be attached and detached from the arm via the QR connector at the end of the arm without requiring the use of hand tools.

C.2.3 * Rotating Gripper Attachment for the Arm. The SRIT shall include a rotating gripper attachment for the arm, with the following capabilities:

C.2.3.1 The gripper wrist shall be able to tilt at least +/- 90 degrees.

C.2.3.2 The gripper shall be able to grasp objects that weigh the equivalent of 1 liter of water.

C.2.3.3 The gripper wrist shall be able to rotate at speeds of at least 10 degrees per second.

C.2.3.4 The total weight of the gripper arm shall be under 7 lbs.

C.2.3.5 The gripper shall be able to rotate/grasp based on input through the PTO connection.

C.2.3.6 The gripper shall be able to be attached and detached from the arm via the QR connector at the end of the arm * without requiring the use of hand tools.

C.2.4 Briefcase OCU. The SRIT shall include a briefcase OCU with the following capabilities:

C.2.4.1 The OCU shall prrovide a display screen showing the output of a camera mounted on the arm.

C.2.4.2 The OCU shall provide a connector for a commercial-off-the-shelf (COTS) game controller to plug into.

* Modification P00001 revises Paragraph C.2.3.

C.2.4.3 The operator shall be able to press the game controller joysticks/buttons to send commands to the OCU. Upon receiving the joystick/button commands, the OCU shall send the appropriate JAUS message to the arm control electronics to control the arm and the attached tool.

C.2.4.4 As different tools are attached to the end of the arm, the tool identification information shall be relayed to the OCU via a JAUS communications link. The OCU shall remap the game controller inpus and help screens to match the tool currently attached.

C.2.4.5 The OCU shall provide wireless control of the arm.

C.3. SRIT Testing and Demonstration.

RE2 shall prepare and deliver a system-level test and demonstration plan for for Contracting Officer's Representative (COR) approval or disapproval by 14 months after contract award, in accordance with (IAW) Exhibit A, Contract Data Requirements List (DD Form 1423), Data Item No. A001 (Test Plan). RE2's demonstration shall include integrating the SRIT with two mock-up robotic unmanned ground vehicle (UGV) platforms, and showing that their prototype SRIT can meet the requirements in the scope of work.

C.4 Meetings.

C.4.1 Kick-off Meeting. RE2 shall plan and conduct a one (1) day kick-off meeting at TACOM within 30 days after contract award, to explain their plans for accomplishing this project. RE2 shall also provide the COR with a disk of drawings, photographs, and video showing project progress as of the completion of the Phase I Option work, IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A002 (Presentation Material).

C.4.2 Interim Progress Review (IPR) Meetings. RE2 shall plan and conduct a one-day IPR meeting at TACOM at the end of 6th month after contract award, and again at the end of the 13th month after contract award. RE2 shall explain their progress to date, including problems encountered, solutions recommended, costs expended, and plan for successfully completing this project. At each IPR meeting, RE2 shall also provide the COR with a disk of drawings, photographs, and video showing project progress to date, IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A002 (Presentation Material).

Note: All demonstrations and meetings shall be held at TACOM, unless otherwise agreed on by RE2 and the COR.

C.5 Deliverables.

C.5.1 Test and Demonstration Plan. RE2 shall submit a system-level test and demonstration plan IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A001.

C.5.2 Presentation Material. RE2 shall submit "Presentation Material" IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A002.

C.5.3 Progress Reports. RE2 shall submit "Contractor's Progress, Status and Management Reports," IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A003.

C.5.4 Research and Development (R&D) Project Summary. RE2 shall submit a "R&D Project Summary" IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A004.

C.5.5 Scientific and Technical Report. RE2 shall submit a draft and final "Scientific and Technical Report" IAW Exhibit A, CDRL (DD Form 1423), Data Item No. A005.

C.5.6 SRIT. RE2 shall deliver 1 SRIT, meeting the requirements in this scope of work, to the COR by 18 months after contract award.

*** END OF NARRATIVE C 0001 ***